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(54) PIEZOELECTRIC CERAMIC COMPOSITION AND ITS PRODUCTION

(57)Abstract:
PROBLEM TO BE SOLVED: To improve heat resistance and thermal shock resistance by calcining a mixture obtained by adding a specific amount of Mn3O4 to a main component comprising Pb, Mn, Nb, Ti, Zr and O, and in a specified composition, milling the calcined product, adding an organic binder to the milled product, compacting the resultant materials, baking the compact, and carrying out the polarization of the baked compact.
SOLUTION: Mn3O4 in a proportion of 0.3-0.8 wt.% as a subsidiary ingredient based on a main component in the proportion of 100 wt.% is added to and mixted with the main components of the formula Pbα(Mn1/3Nb2/3)xTiyZrzO3 ($1.00 \leq \alpha \leq 1.05$; $0.07 \leq x \leq 0.28$; $0.42 \leq y \leq 0.62$; $0.18 \leq z \leq 0.45$; $x+y+z=1$). The obtained mixture is calcined at about 900° C, and the calcined product is milled by a ball mill. An organic binder such as a PVA is added to the milled raw material, and the resultant materials are subjected to pressure compacting to provide a prescribed shape. The obtained compact is baked in a closed furnace at about 1,150-1,290° C. The obtained sintered body is polarized by applying 2.5-3.0 kV/mm direct electric field to the sintered body at 130-180° C. As the result, the objective piezoelectric ceramic composition excellent in heat stability, and causing small change of a resonance frequency after applying a thermal shock, and before and after of temperature cycling is obtained.

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